

AMENDMENTS

In the Claims:

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A high-resistance silicon wafer having resistivity of $100 \Omega\text{cm}$ or more, wherein an oxygen precipitate (~~BMD~~) having a size of $0.2 \mu\text{m}$ or more is formed so as to have density of $1 \times 10^4/\text{cm}^2$ in the wafer, an oxygen concentration in the wafer as measured in accordance with ASTM F-121, 1979 is $12 \times 10^{17} \text{ atoms/cm}^3$ (~~ASTM F-121, 1979~~) or less, and a carbon concentration is in a range of $0.5 \times 10^{16} \text{ atoms/cm}^3$ or more to $1.0 \times 10^{17} \text{ atoms/cm}^3$.

2. (Currently Amended) The high-resistance silicon wafer according to claim 1, wherein a density of a LPD (~~Light Point Defect~~) light point defect having a size of $0.12 \mu\text{m}$ or more and observed on a surface of the wafer is controlled ~~so as to be~~ $0.2/\text{cm}^2$ or less.

3. (Currently Amended) A high-resistance silicon wafer having resistivity of $100 \Omega\text{cm}$ or more, wherein a density of a grown-in defect detected by seco etching is $1 \times 10^3/\text{cm}^3$ or less, an oxygen precipitate (~~BMD~~) having a size of $0.2 \mu\text{m}$ or more is formed so as to have density of $1 \times 10^4/\text{cm}^2$ or more in the wafer, [[and]] an oxygen concentration in the wafer as measured in accordance with ASTM F-121, 1979 is $12 \times 10^{17} \text{ atoms/cm}^3$ (~~ASTM F-121, 1979~~) or less, and a carbon concentration in the wafer is in a range of $0.5 \times 10^{16} \text{ atoms/cm}^3$ to $1.0 \times 10^{17} \text{ atoms/cm}^3$.

4. (Canceled)

5. (Currently Amended) The high-resistance silicon wafer according to claim 1 or 3, wherein a ~~DZ (Denuded Zone)~~ denuded zone layer is formed at least $5 \mu\text{m}$ or more in depth from a surface of the wafer.

6. (Currently Amended) The high-resistance silicon wafer according to claim 1 or 3, wherein value of the oxygen concentration (~~ASTM F-121, 1979~~) of the wafer as measured in accordance with ASTM F-121, 1979 is limited in ranges of $12 \times 10^{17} \text{ atoms/cm}^3$ or less, $7 \times 10^{17} \text{ atoms/cm}^3$ or less, and $5.8 \times 10^{17} \text{ atoms/cm}^3$ or less when the resistivity of the wafer is not less than $100 \Omega\text{cm}$ and less than $300 \Omega\text{cm}$, not less than $300 \Omega\text{cm}$ and less than $2000 \Omega\text{cm}$, and not

less than 2000 Ω cm, respectively.

7. (Currently Amended) A manufacturing method of manufacturing a high-resistance silicon wafer, characterized in that comprising:

providing a primary silicon wafer in which resistivity is 100 Ω cm or more, oxygen concentration as measured in accordance with ASTM F-121, 1979 is 12×10^{17} atoms/cm³ (ASTM F-121, 1979) or more, and a carbon concentration [[is]] in a range of 0.5×10^{16} atoms/cm³ to 1.0×10^{17} atoms/cm³ or more is used, and

producing the high-resistance silicon wafer in which a remaining oxygen concentration in the wafer is controlled to be 12×10^{17} atoms/cm³ as measured in accordance with ASTM F-121, 1979 (ASTM F-121, 1979) or less by performing a heat treatment for forming an oxygen precipitate nucleus and a heat treatment for growing the oxygen precipitate on the primary silicon wafer.

8. (Currently Amended) A manufacturing method of manufacturing a high-resistance silicon wafer, characterized in that comprising:

providing a primary silicon wafer in which resistivity is 100 Ω cm or more, an oxygen concentration as measured in accordance with ASTM F-121, 1979 is 14×10^{17} atoms/cm³ (ASTM F-121, 1979) or more, a carbon concentration in the wafer is controlled to be in a range of 0.5×10^{16} atoms/cm³ to 1.0×10^{17} atoms/cm³, and a density of a grown-in defect detected by seco etching is $1 \times 10^3/\text{cm}^3$ is used, a remaining oxygen concentration in the wafer as measured in accordance with ASTM F-121, 1979 is controlled to be 12×10^{17} atoms/cm³ (ASTM F-121, 1979) or less by performing a heat treatment for forming an oxygen precipitate nucleus and a heat treatment for growing the oxygen precipitate on the primary silicon wafer.

9. (Currently Amended) The manufacturing method of the high-resistance silicon wafer according to claim 7 or 8, wherein the heat treatment for forming the oxygen precipitate nucleus is a low-temperature heat treatment performed at 500 to 900°C for 5 hours or more.

10. (Currently Amended) The manufacturing method of the high-resistance silicon

~~wafer~~ according to claim 9, wherein the conditions of the low-temperature heat treatment is at 700 to 900°C for 5 hours or more.

11. (Currently Amended) The manufacturing method of the high-resistance silicon ~~wafer~~ according to claim 7 or 8, wherein the heat treatment for growing the oxygen precipitate is a high-temperature heat treatment performed at 950 to 1050°C for 10 hours or more.

12. (Currently Amended) The manufacturing method of the high-resistance silicon ~~wafer~~ according to claim 7 or 8, characterized in that further comprising performing an oxygen outward diffusion heat treatment is performed on the wafer at 1100 to 1250°C for 1 to 5 hours before the heat treatment for forming the oxygen precipitate nucleus.

13. (Currently Amended) The manufacturing method of the high-resistance silicon ~~wafer~~ according to claim 12, characterized in that further comprising performing the oxygen outward diffusion heat treatment is performed in a gas atmosphere containing nitrogen gas.

14. (Currently Amended) The manufacturing method of the high-resistance silicon ~~wafer~~ according to claim 12, characterized in that wherein the oxygen outward diffusion heat treatment is performed in an atmosphere of a hydrogen gas, argon gas or mixed gas of these thereof.

15. (Currently Amended) The manufacturing method of the high-resistance silicon ~~wafer~~ according to claim 7 or 8, characterized in that further comprising performing a rapid thermal annealing process is performed on the wafer before the heat treatment for forming the oxygen precipitate nucleus.

16. (Currently Amended) The manufacturing method of the high-resistance silicon ~~wafer~~ according to claim 15, wherein the conditions of the rapid thermal annealing process is carried out at 1150 to 1300°C for 1 to 60 seconds in an atmosphere containing nitrogen.

17. (Canceled)